
Multistage compressor operation while filling a container

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Compressors in the multi-stage reciprocating compressor technology are often used to fill the containers of various sizes. In this case we have a variable mode, i.e. compressor operates with variable discharge pressure. This article describes a mathematical model of multi-stage reciprocating compressor operation in the mode of filling the container with the sequential stages load. The model allows to take into account the effect of variable discharge pressure on the intermediate interstage pressure change, stairs pressure ratio, the coefficients of compressor stages supply and consumed power. The article presents the flowchart of the calculation, which is the basis for the program developed by Delphi programming language. The results of time calculation for filling the container up to the predetermined pressure and the experimental results confirm the adequacy of the developed computational model. Method of calculation can also be used to determine the time of the gas transfer from one container to another.

Keywords: *multi-stage reciprocating compressor, variable discharge pressure, mathematical model, filling time.*

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